

SOIL ERODIBILITY (K) FACTORS AND SOIL LOSS TOLERANCE (T) FACTOR

General

Soil erodibility factors (K) and Soil loss tolerances (T) are used in equations that predicts the amount of soil loss resulting from rainfall erosion of cropland. The Soil loss prediction procedure is useful to guide the selection of practices for soil and water conservation.

The information contained here is a brief definition of T and K factors. The procedure for determining these factors, as well as other detailed information, can be found in Agriculture Handbook No. 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE), USDA, ARS, 1997.

Soil erodibility factors (K) and Soil loss tolerances (T) for soil map units in each county are listed in Section I, Resources and Evaluation Tools, in the Soils Section – Guide to Interpretive Groups (Table 1).

Soil Erodibility K factors (Kf and Kw)

Soil erodibility factors (Kw) and (Kf) are erodibility factors which quantify the susceptibility of soil detachment by water. These erodibility factors predict the long-term average soil loss, which results from sheet and rill erosion under various alternative combinations of crop systems and conservation techniques. Factor Kw considers the whole soil, and factor Kf considers only the fine-earth fraction, which is the material <2.0 mm in diameter..

Soil erodibility factors Kw or Kf are used in erosion prediction equations USLE and RUSLE. Soil properties that influence rainfall erosion are (1) those that affect infiltration rate, movement of water through the soil, and water storage capacity and (2) those that affect dispersion, detachability, abrasion, and mobility of soil particles by rainfall and runoff. Some of the most important properties are texture, organic matter content, size and stability of structural aggregates in the exposed layer, permeability of the subsoil, and depth to a slowly permeable layer.

Soil Loss Tolerance (T) Factor

The T factor is the soil loss tolerance. It is defined as the maximum amount of erosion at which the quality of a soil as a medium for plant growth can be maintained.

This quality of the soil to be maintained is threefold in focus. It includes maintaining (1) the surface soil as a seedbed for plants, (2) the atmosphere-soil interface to allow the entry of air and water into the soil and still protect the underlying soil from wind and water erosion, and (3) the total soil volume as a reservoir for water and plant nutrients, which is preserved by minimizing soil loss.

The rate is expressed in tons of soil loss per acre per year. Rates of one through 5 are used, depending upon soil properties and prior erosion. A single T factor is assigned to each map unit component.